

# **REMARKS**

Favorable reconsideration and allowance of the subject application are respectfully requested in view of the following remarks.

## **Summary of the Office Action**

Claims 1-6 and 9-12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Kawasumi et al.* (JP 7-263,752) in view of *Fan et al.* (U.S. Patent No. 5,300,788), *Chen et al.* (U.S. Patent No. 6,163,038) and *McIntosh et al.* (U.S. Patent No. 5,684,309).

Claims 7, 8 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Kawasumi et al.* in view of *Fan et al.*, *Chen et al.*, and *McIntosh et al.*, and further in view of *Kotaki et al.* (U.S. Patent No. 5,281,830) and *Scifres et al.* (U.S. Patent No. 4,280,108).

## **Summary of the Response to the Office Action**

Applicants cancel claims 9-10 without prejudice or disclaimer by this amendment. Claims 1, 2, 4-8, 11, 13 and 15 are amended. Accordingly, claims 1-8 and 11-20 are currently pending, and claims 1-8 and 11-15 are currently under consideration.

## **Claim Rejection Under 35 U.S.C. §103(a)**

Claims 1-6 and 9-12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Kawasumi et al.* in view of *Fan et al.*, *Chen et al.*, and *McIntosh et al.* Claims 7, 8 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Kawasumi et al.* in view of *Fan et al.*, *Chen et al.*, *McIntosh et al.*, *Kotaki et al.*, and *Scifres et al.* To the extent that these rejections might be applied to the claims as newly-amended, they are respectfully traversed for at least the following reasons.

With regard to claims 9-10, Applicants respectfully request withdrawal of the rejections of claims 9-10 as the cancellation of claims 9-10 renders the rejections moot.

With regard to claims 1-8 and 11-15, Applicants respectfully submit that the applied references, whether taken alone or in combination, fail to teach or suggest the claimed combination as set forth in independent claim 1, as newly-amended, of a white light LED having two light emitting layers including at least “a first light emission device being formed on the GaAs substrate, and composed of III-V family compound semiconductor which emits a light with a wavelength in a range of about 635 – 780 nm; a second light emission device being formed on the first light emission device, and composed of II-VI family compound semiconductor which emits a light with a wavelength in a range of about 450 – 550 nm; and electrodes being formed on a region of the GaAs substrate, the first light emission device, and the second light emission device, respectively.”

In addition, Applicants respectfully submit that the applied references, whether taken alone or in combination, fail to teach or suggest the claimed combinations as set forth in independent claims 11 and 13, as newly-amended, of a white light LED having two light emitting layers including at least “a first light emission device composed of a multi-quantum well structure of GaAs/AlGaAs or InGaP/AlInGaP on the GaAs substrate having a stack of a first clad layer, a first active layer, and a second clad layer disposed in succession, wherein the first light emission device emits a light with a wavelength in a range of about 635 – 780 nm,” and “a second light emission device composed of a multi-quantum well structure of ZnCdSe/ZnMgSSe or ZnCdSe/ZnMgBeSe on the GaAs contact layer having a stack of a third clad layer, a second active layer, and a fourth clad layer disposed in succession, wherein the second light emission device emits a light with a wavelength in a range of about 450 – 550 nm.”

According to an embodiment of the present invention as claimed, a white LED includes a first light emission device of III-V family compound semiconductor on the substrate having an

active layer, a second light emission device of II-VI family compound semiconductor on the first light emission device having an active layer, and electrodes in regions of the substrate, and the first and second light emission devices, respectively. The present invention thereby provides a white LED having a long lifetime, and implementing a wavelength band of white or a variety of visible lights by growing the III-V family compound semiconductor with a 635-780 nm wavelength range and the II-VI family compound semiconductor with a 450 – 550 nm wavelength range, with lattices of the two semiconductor matched.

In contrast to the claimed combinations as whole, Applicants respectfully submit that *Kawasumi et al.* discloses a semiconductor color light emitting element having a laminated structure of individual light emitting elements R, G, and B by light emitting diodes or semiconductor lasers composed of III-V and II-VI compound semiconductor light emitting elements to lattice-match with GaAs, put on a common GaAs substrate.

Thus, the arrangement as taught by *Kawasumi et al.* includes at least three emitting layers, with R, G, and B light emitting layers formed on the semiconductor element respectively. Specifically, the Office Action asserts that *Kawasumi et al.* could produce a white light by using a plurality of R, G and B light emitting elements with different wavelengths from each other and by combining the R, G and B color lights. However, the white LED as set forth in Applicants' claimed combinations has lattices of only two different light emitting devices matched. Thus, in order to obtain a white light by the arrangement of *Kawasumi et al.*, at least three light emitting elements, i.e., the R, G, and B light emitting elements, and three driving elements. As a result, the fabrication processes and circuits of *Kawasumi et al.* to obtain a white light are complicated. However, Applicants' claimed combinations are directed to a white LED by using a GaAs

substrate and two light emitting devices, thereby reducing the cost and simplifying the fabrication process.

Moreover, Applicants further respectfully submit that none of *Fan et al.*, *Chen et al.*, *McIntosh et al.*, *Kotaki et al.*, and *Scifres et al.* is relied upon as teaching an LED comprising a first light emission device composed of III-V family compound semiconductor, and a second light emission device composed of II-VI family compound semiconductor. In addition, Applicants respectfully submit that none of *Fan et al.*, *Chen et al.*, *McIntosh et al.*, *Kotaki et al.*, and *Scifres et al.* remedies the above-mentioned deficiencies of *Kawasumi et al.*

M.P.E.P. §2143.03 instructs that “[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).” Since the applied references, whether taken alone or in combination, fail to teach or suggest each and every element set forth in independent claims 1, 11, and 13, as newly-amended, it is respectfully submitted that the applied references do not render claims 1, 11 and 13 unpatentable. Further, since claims 2-8, 12, 14 and 15 depend from claims 1, 11 and 13, it is respectfully submitted that the applied references also do not render claims 2-8, 12, 14 and 15 unpatentable. Accordingly, withdrawal of the rejections of claims 1-8 and 11-15 under 35 U.S.C. §103(a) is respectfully requested.

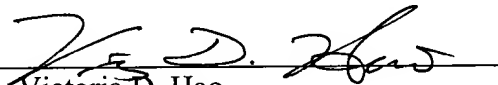
### **Conclusion**

In view of the foregoing, withdrawal of the rejections and allowance of the pending claims are earnestly solicited. Should there remain any questions or comments regarding this response or the application in general, the Examiner is urged to contact the undersigned at the number listed below.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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Dated: August 11, 2003

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